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## ABSTRACT

Increasingly competitive telecommunications business in Indonesia, the Smart Telecom plans to stay a few steps to compete among other telecom operators. The one of many ways for that is optimizing the existing network by leveraging existing infrastructure. This Final Project has been analyzed the optimization of microwave radio backbone network in Smart Telecom and reconfigure Bandung area network by utilizing the tower whose status is purchased. Besides replacing the conventional radio devices based TDM to IP radio devices to meet consumer needs by providing various services to both voice, data, video at an affordable price. In this final analysis has been done on the transmission of radio network optimization Smart Telecom backbone network based on TDM to optimize the tower with the status of purchase to reduce the rent to be more efficient, and build a new link by installing Radio IP SLF-H (Sagem Link FH).

From the analysis results that are commercially available, Smart Telecom can save about Rp.2.000.000.000, - per year for five towers are optimized. While the technical, the use of SLF-H IP Radio frequency 7 GHz with a 0.6 m diameter antenna, with a 128 MHz modulation, the capacity to 155 Mbps backbone network with the Software Pathloss 4.0 obtained availability values as *Smart Telecom* required minimum 99.9995% and RSL meets the minimum sensitivity that accepted by equipment with allowable fading margin < 30 dB. While the Ethernet Test, the throughput was on average above 99%, Frame Loss value is 0%, and average latency values of less than 1 ms.

From the results of this analysis, both in terms of economic and technical, the operator will get benefit from cost savings, as well as the optimal IP Radio SLF-H which can be seen from the availability of more than minimal value is standardized by Smart Telecom and Reliability value is also high and the most important is the ethernet test results are in accordance with the standards expected.

Keywords : infrastructure, Radio IP Microwave, cost saving, availability, reliability, Ethernet, throughput, frame loss, latency.